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Statement of
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Chairman Boehlert and Members of the Committee, thank you for the opportunity to speak with you today about the Nation's evolving goals to enhance the quality of science, technology, engineering and mathematics (STEM) education.

NASA shares the concerns of the President, Committee, and Nation regarding the lack of public understanding of scientific inquiry; an aging aerospace workforce; a shrinking pipeline of students with science and engineering skills; a shortage of mathematics, science, and technology teachers; and, a threat to America's capability to continue as a world leader in science and technology.

Not only are these fields at risk, but STEM education is required for many careers in the 21st century workplace and the analytical and critical thinking skills learned through these fields of study are essential in numerous career fields.

For nearly 50 years, NASA's journeys into air and space have developed humankind's understanding of the universe, advanced technology breakthroughs, enhanced air travel safety and security, and expanded the frontiers of scientific research. These accomplishments share a common genesis: Education.

As a critical component of achieving NASA's mission, the Agency's education activities reflect a diverse portfolio of Elementary and Secondary Education, Higher Education, e-Education, Informal Education, and Minority University Research and Education Programs (MUREP). Through its unique mission, workforce, and facilities, NASA is leading the way to inspire interest in STEM careers, as few other organizations can. Our efforts have also made significant impacts in engaging underserved and underrepresented communities in STEM.

Accordingly, we are preparing the pathway for the next generation with great anticipation. These “explorers and innovators of the new millennium” must fully represent our Nation’s vibrant and rich diversity. Furthermore, we will support our Nation’s universities, colleges and community colleges by providing exciting research and internship opportunities that “light the fire” and “fuel the passion” for a new culture of learning and achievement in STEM.

NASA's educational activities are designed to inspire, engage, educate, and employ our Nation's talented youth. As contributors to achieving the Nation's goals, NASA is committed to three primary objectives to help improve the state of STEM education in our country:

1. **Strengthen NASA and the Nation's future workforce** – NASA will identify and develop the critical skills and capabilities needed to ensure achievement of the Vision for Space Exploration, science, and aeronautics.

2. **Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty -** NASA will focus on engaging and retaining students in STEM education programs to encourage their pursuit of educational disciplines critical to NASA's future engineering, scientific, and technical missions.

3. **Engage Americans in NASA's mission** – NASA will build strategic partnerships and linkages between STEM formal and informal education providers. Through hands-on, interactive, educational activities, NASA will engage students, educators, families, and the general public to increase America's science and technology literacy.

Education is led by the Assistant Administrator for Education, who has agency authority for ensuring a balanced portfolio to achieve our three outcomes. The Assistant Administrator for Education ensures all aspects of NASA are maximizing their potential to highlight the Agency's people, resources, and facilities in support of the Nation's education efforts to develop the skilled workforce necessary to achieve the Agency's goals and objectives.

The success of NASA's education portfolio depends upon strategic planning across the Agency. Close coordination through high-performing teams is required among NASA's Office of Education, Mission Directorates, Centers, the Office of Human Capital Management, the Office of Diversity and Equal Opportunity, and other Mission Support offices to ensure that workforce requirements are identified and met, and that education efforts are aligned and focused on building the future workforce.

Evaluation of NASA Education Programs

The Assistant Administrator for Education ensures a rigorous evaluation of the Agency's education portfolio. The portfolio is routinely evaluated to document performance, validate that planned outcomes have been achieved, drive improvements in program implementation, and ensure the integration of our education programs in our missions. Direct linkages between NASA's scientific and engineering activities and the Agency's education efforts ensure that they are unique, provide hands on experience, and not redundant with the programs of other federal agencies.

The objectives for NASA's education evaluation are to ensure that (a) program activities are adequately documented, (b) the extent to which intended outcomes have been achieved is determined, (c) necessary improvements to program operations are identified, and (d) information is available to support data-driven decision-making about the individual and collective components of the education portfolio. It is also critical that NASA K-12 education programs in both formal and informal environments reinforce and augment local, state, and national learning improvement goals.

Three complimentary components form the core of the NASA education performance measurement approach toward which the Agency is working. The first component, Evaluation, ensures that performance results of all NASA-supported education activities are documented. The evaluation process ensures that all required data are collected in a systematic manner by project managers who are accountable for performance reporting linked to predefined outcomes. The second component, Review, is designed to verify and validate performance. Through the review process, evidence pertaining to project effectiveness and impact will be collected, analyzed, and reported. NASA will make extensive use of independent, credible evaluators to conduct validation studies. The final component, Assessment, will inform decisions about the total Agency education portfolio in terms of NASA's unique contribution to K-12 student learning and teacher training at both pre- and in-service levels. Decisions made through the assessment process will include factors such as gaps or redundancies in the portfolio, emergent career needs of NASA, direct linkage to the learning and professional development needs of the education community, and budget priorities maximizing the use of limited resources.

Collaboration and Coordination with Other Federal Agencies

As the Agency has strengthened its portfolio and evaluation criteria, we have recognized the need to engage new partners and alliances in achieving our collective goal. Through partnerships, NASA's Office of Education is continually and collaboratively engaged with other federal agencies, including the Department of Education, the National Science Foundation (NSF), the Department of Commerce, as well as with the state coalitions, the District of Columbia, Puerto Rico, and the U.S. territories. Collaboration and coordination takes place in a number of forums. For example, the Assistant Administrator for Education serves as NASA's representative on the Subcommittee on Education and Workforce Development, under the President's National Science and Technology Council (NSTC) Committee on Science.

Shortly after the State of the Union, the Assistant Secretary of Education, Henry Johnson, invited NASA and others to discuss potential collaboration opportunities. We are currently reviewing our portfolio of educational programs to assess NASA's participation. In addition, I serve as the NASA member on the Academic Competitiveness Council, chaired by Secretary Spellings, whose inaugural meeting on March 6th identified a plan of action to respond to the 2005 enacting legislation to address STEM education across the federal government. This initiative will enable us collectively to implement quality programs focused on our future.

Increasing the number of students involved in NASA-related activities at the elementary and secondary education levels will inspire more students to pursue higher levels of study in STEM courses. To meet this country's future needs, we have to tap into the talent that is before us.

Budget for NASA Education Programs

The FY 2007 budget request for NASA's Education programs is $153.3 million. NASA's Education budget request sustains our commitment to excellence in science, technology, engineering and mathematics (STEM) education to ensure that the next generation of Americans can accept the full measure of their roles and responsibilities in shaping the future and meeting the workforce needs to implement the Vision for Space Exploration.

The Agency's ability to fulfill its mission requirements is coming under increasing pressure as it competes for limited resources. This is particularly true in education where the continued growth in Congressionally-directed items is eroding NASA's ability to carry out its educational objective of contributing to the development of the STEM workforce in disciplines needed to achieve

NASA's strategic goals. For FY 2006, more than one-half of the funding available for NASA's education efforts will be applied to these Congressionally-directed items. NASA acknowledges the Congress' commitment to STEM education and will honor Congressional direction before funding programs NASA requested in the budget. However, the redirection of funding has resulted in delays and/or cancellation of planned scholarships, grants, cooperative agreement notices, and other support for the education community across the Nation. It has had a direct impact in NASA's ability to meet existing commitments to students, teachers, faculty, universities and institutions. In implementing our new education framework and strategy, NASA is working with recipients of the Congressionally-directed items to align these initiatives toward overall Agency goals and priorities (workforce, pipeline, and public benefit). We look forward to working with the Congress to capture the strengths of these institutions and through peer-review processes have a strategic, focused impact in the areas cited by the National Academies, the Administration and the Congress to further the Nation's competitiveness. NASA seeks the assistance of Congress in reducing earmarks in the FY 2007 budget process.

NASA Education Programs

Let me illustrate a few examples of the unique innovative projects that NASA makes available to support students across our Nation:

Our **Educator Astronaut Program** selects outstanding educators to become permanent members of the Astronaut Corps. The program uses the visibility and educational opportunities created by the activities of the Educator Astronauts to inspire greater K-12 STEM achievement, promote STEM careers, and elevate public esteem for the teaching profession. In selecting our Educator Astronauts, we identified hundreds of our country's top educators. We have captured their energy through the Network of Educator Astronaut Teachers. They are now in communities all across America, engaging their schools and communities in NASA education activities and informing them of NASA resources (content, people, and facilities).

The **NASA Explorer Schools** form three-year partnerships with NASA. Focused on underserved or underrepresented populations, the program is designed for education communities at the 4-9 grade levels. We assist middle schools improve teaching and learning in STEM education through significant structural (professional development, stipends, grants) and curricular support based on NASA resources.

The **Science Engineering Mathematics and Aerospace Academy Program (SEMAA)** reaches K-12 minority students that are traditionally underrepresented in careers involving STEM. Students meet during school, after school or on Saturday mornings and during the summer to engage in hands-on, interactive learning sessions that are specifically designed for each grade level.

Between the International Space Station, the space shuttle, sounding rockets and high altitude balloons, NASA's **Education Flight Projects** provide hands-on experiences to inspire and motivate students to pursue studies and careers in STEM through participation in NASA research applications. NASA is using its unique assets like the C-9 better known as "The Vomit Comet" to allow students to study microgravity; we're launching student experiments more than 25 miles above the Earth on sounding rockets; and our astronauts make phone calls from 240 miles above Earth's atmosphere to students to involve them in current research aboard the International Space Station. All these opportunities take advantage of our flight hardware projects provide real, hands-on experiences to inspire the minds, imaginations, and career ambitions of America's young people.

Teacher training for Worlds beyond Our Own captures the excitement and discovery surrounding planetary exploration. NASA and the Johns Hopkins Applied Physics Laboratory developed workshops and materials to assist educators in capturing the excitement surrounding NASA's New Horizons mission to Pluto that launched in January 2006. New Horizons is the fastest spacecraft ever launched from Earth, on board one of America's most powerful rockets, and will be traveling the farthest distance of any NASA spacecraft to begin its primary mission. Students will grow up with this project. Today's elementary school students will be in college when this spacecraft encounters Pluto.

In addition to in-service workshops based on our missions, NASA is committed to the pre-service training of our future educators. Our 11th annual **Pre-Service Teacher Conference** was keynoted by one of America's finest and most recognized teachers, Jaime Escalante. The conference was created to help undergraduates and aspiring teachers develop the confidence and skills to effectively teach mathematics and science using cutting-edge technology and educational materials only NASA can provide. Over 500 students and faculty from approximately 55 schools, representing 35 states participated this year.

Museums and Science Centers are developing activities and materials to inspire, educate, and engage students, educators and the general public. They are also hosting professional development opportunities for formal and informal education professionals across the Nation. For example, NASA and the Children's Museum of History, Natural History, Science and Technology in Utica, N.Y. unveiled two new exhibits at the museum last year. The exhibits "Why We Explore" and "Space Station Imagination" provide an overview of the history and future of space exploration. Astronaut Ed Lu, a veteran Space Station astronaut, who spent six months aboard the International Space Station, hosted the unveiling.

NASA's Great Moonbuggy Competition allows high school and college students' to race into the future and cross the surface of the moon without leaving the Earth. Teams from the United States and Puerto Rico design human-powered vehicles to compete in NASA's annual Great Moonbuggy Race. The race was inspired by the lunar rover vehicles astronauts drove on the moon during three Apollo missions. This year's event, which is open to the media and public, runs April 7-8 at the U.S. Space & Rocket Center in Huntsville, Alabama.

Conclusion

We must encourage every segment of our population -- girls and boys alike -- from every walk of life, of every color and creed, to reach out and prepare for the opportunities of the 21st century. Building a pipeline of science and engineering talent to serve in the coming decades as we implement the Vision for Space Exploration to continue America's pre-eminence in space and aeronautics research and development can and must be done. NASA's mission is one of dreams, vision and exploration – characteristics that are ingrained in the American spirit and the underpinning of innovation and economic competitiveness. Our investment in STEM education is to nurture the next generation of Eileen Collins, Carl Sagan, Norm Augustine, and Neil deGrasse Tyson.

I would like to commend the Committee for their efforts to improve K-12 STEM education. NASA looks forward to continuing to serve as a contributor to STEM education as well as other national needs. Again, thank you for the opportunity to participate in this important dialogue. I would be happy to answer any questions you may have for NASA.